2.3 AIR QUALITY

Issues (and Supporting Information Sources):	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
AIR QUALITY—Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. **Would the proposed project:**				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☒	☐	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

SETTING

The primary factors that determine air quality are the location of air pollutant sources and the amount of pollutants emitted. Although, meteorological and topographical conditions are also important factors.

PROPOSED PROJECT

The project lies completely within the City and County of San Francisco. Since most of San Francisco's topography is below 200 feet, marine air is able to flow easily across most of the City, making its climate cool and windy. Pollutant emissions in San Francisco are high, especially from motor vehicle congestion. Localized pollutants, such as carbon monoxide, can build up in "urban canyons"; although the winds in San Francisco are generally strong enough to carry the pollutants away from the City before they can accumulate (BAAQMD, 1998).

The proposed project area is primarily used for commercial and industrial activities. There are some residential neighborhoods in proximity to the proposed project area, particularly to the south. Existing emission sources within the vicinity of the project include stationary sources, such as the Potrero and Hunters Point power plants, as well as mobile sources. The smaller stationary sources in the area, such as paint shops and small boilers, emit quantities of emissions that are substantially less than the mobile sources and the power plants. Mobile sources include

autos and trucks traveling on Interstate 280, located west of the project site, and autos and trucks traveling on nearby Third Street as well as other local streets.

The Bay Area has relatively good air quality despite its extensive urbanized area, vehicles, and industrial sources. The Bay Area's coastal location and favorable meteorology help to keep its pollution levels low most of the time. Winds within San Francisco display several characteristic regimes; winds are generally from the west, although wind patterns are often influenced greatly by local topographic features. In the project area, winds generally blow out of the west-southwest, west, and west-northwest. Wind data collected within the vicinity indicates that winds blowing from the south, clockwise through northwest, account for approximately 67 percent of all winds observed in the project area. Average wind speeds in the area are approximately eight miles per hour (NOAA, 2004).

Criteria Pollutants

Regulation of criteria pollutants is achieved through both national and state ambient air quality standards and emissions limits for individual sources of air pollutants. Criteria air pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), suspended particulate matter (PM_{10} and $PM_{2.5}$), and lead. The proposed project is located within the San Francisco Bay Area Air Basin (Basin). The Basin covers all or part of 9 counties in the San Francisco Bay region, and the airshed has been designated by the California Air Resources Board (ARB) as nonattainment for the Federal and State ambient air ozone standards, as well as nonattainment of the state PM_{10} standard. The Basin is "attainment" or "unclassified" for the other criteria air pollutants (BAAQMD 2003). **Table 2.3-1** provides the California and the Federal air quality standards and attainment status.

As shown in **Table 2.3-2**, in San Francisco County, state and federal AAQS for PM_{10} and $PM_{2.5}$ have been exceeded in the Basin. Between 1999 and 2003, the maximum 24-hour $PM_{2.5}$ concentration within San Francisco County was 77 $\mu g/m^3$. This level was reached in 2001, as shown in Table 2.3-2. The maximum 24-hour PM_{10} concentration for the same period was 78 $\mu g/m^3$. This level was reached in 1998, as shown in Table 2.3-2. The federal 24-hour $PM_{2.5}$ and PM_{10} air quality standards were not exceeded in San Francisco County during this period. Existing and probable future levels of air quality in the project vicinity with respect to ozone, carbon monoxide, PM_{10} and $PM_{2.5}$, which are the pollutants of most concern, can be generally inferred from ambient air quality measurements conducted by the BAAQMD at the following two monitoring stations: the Arkansas Street station at 16th and Arkansas Streets, about 1.5 miles northwest of Islais Creek which measures CO, O_3, nitrogen dioxide, sulfur dioxide PM_{10} and $PM_{2.5}$, and the station at 939 Ellis Street between Van Ness and Franklin which only measures carbon monoxide (BAAQMD 2004).

TABLE 2.3-1
BAY AREA AIR QUALITY MANAGEMENT DISTRICT ATTAINMENT STATUS

Pollutant	Averaging Time	State[a]	National[b]	Attainment Status[d]
Ozone	1 hour 8 hour	0.09 ppm[c] NA[d]	0.12 ppm .08 ppm	N U
Carbon Monoxide	1 hour 8 hour	20 ppm 9 ppm	35 ppm 9 ppm	A A
Nitrogen Dioxide	1 hour Annual	0.25 ppm NA	NA 80 µg/m^3 [c]	A A
Sulfur Dioxide	1 hour 24 hour	0.25 ppm 0.04 ppm	NA 0.14 ppm	A A
Particulate Matter ($PM_{2.5}$)	24 hour Annual Arithmetic Mean	NA 12 µg/m^3	65 µg/m^3 15 µg/m^3	U U
Particulate Matter (PM_{10})	24 hour Annual Arithmetic Mean	50 µg/m^3 20 µg/m^3	150 µg/m^3 50 µg/m^3	N/U A
Sulfates	24 hour	25 µg/m^3	NA	A
Lead	30 day	1.5 µg/m^3	NA	A
Hydrogen Sulfide	1 hour	0.03 ppm	NA	A
Vinyl Chloride (chloroethene)	24 hour	0.010 ppm	NA	A
Visibility Reducing Particles	8 hour	see note [e]	see note [f]	**NA**

[a] California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM10, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded.

[b] National standards other than for ozone, particulates and those based on annual averages, are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations are 0.08 ppm or less.

[c] ppm = parts per million by volume; µg/m^3 = micrograms per cubic meter.

[d] A=Attainment; N=Nonattainment; U=Unclassified; NA = Not Applicable.

[e] Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

[f] USEPA encourages state and tribal communities to participate in regional planning organizations to address visibility.

SOURCE: BAAQMD, 2003. Bay Area Attainment Status as of July 2004.

TABLE 2.3-2
AIR POLLUTANT SUMMARY FOR THE PROPOSED PROJECT AREA, 1999-2003

Pollutant	Concentrations, by Year[a]					
	Std.[b]	1999	2000	2001	2002	2003
Ozone:						
Highest 1-hour-average concentration, ppm[c]	*0.09*	.08	.06	.08	.05	0.085
Number of violations[d]		0	0	0	0	0
Highest 8-hour-average concentration, ppm[c]	*0.08*	.05	.04	.05	.05	0.06
Number of violations		0	0	0	0	0
Carbon Monoxide:						
Highest 1-hour-average concentration, ppm	*20*	5.4	5.5	4.0	3.5	3.6
Number of violations		0	0	0	0	0
Highest 8-hour-average concentration, ppm	*9.0*	3.7	3.2	3.3	2.6	2.8
Number of violations		0	0	0	0	0
Suspended Particulate (PM2.5):						
Highest 24-hour-average concentration, $\mu g/m^3$ [c]	*65*	71	48	77	70	42
Violations/Samples[e] (days per year)		3	0	5	4	0
Annual Geometric Mean, $\mu g/m^3$	*12*	12.6	11.4	11.5	13.1	10.1
Suspended Particulate (PM10):						
Highest 24-hour-average concentration, $\mu g/m^3$	*50*	78	63	67	74	51
Violations/Samples[e] (days per year)		6	2	7	2	1
Annual Geometric Mean, $\mu g/m^3$	*20*	26	24	26	25	22

[a] Monitoring was collected from the Arkansas Street station located at 10 Arkansas Street close to 16th Street in San Francisco.
[b] State standard not to be exceeded.
[c] ppm: parts per million; $\mu g/m^3$: micrograms per cubic meter.
[d] For ozone, "number of violations" refers to the number of days in a given year during which standards were exceeded.
[e] Indicates the number of violations and the number of samples taken in a given year.

NOTE: **Bold** values are in excess of applicable standard. NA = Not Available.

SOURCES: BAAQMD, *Air Quality Data Summaries*, 1999, 2000, 2001, 2002. USEPA, *Ambient Monitoring Data* 2003.

Toxic Air Contaminants

BAAQMD also operates a regional monitoring network that collects ambient concentration data on some of the more pervasive toxic air contaminants. For the most part, emissions of TACs have declined substantially since 1997. For example, ambient benzene levels declined substantially in 1996 with the advent of Phase 2 reformulated gasoline. Due largely to the observed reductions in ambient benzene and 1,3-butadiene levels, the average cancer risk in the

Bay Area from ambient levels of toxic air contaminants has declined throughout the 1990s.

Table 2.3-3 contains the mean concentrations of selected toxic pollutants, which are monitored on a nominal 10-day cycle at the San Francisco Arkansas Street Station, located at 10 Arkansas Street close to 16th Street. This monitoring program was designed to determine the concentrations of various gaseous toxic pollutants in the air, which the EPA has defined as those that may reasonably be anticipated to result in increased deaths or serious illness, and which are not already regulated. The California Air Resource Board (CARB) identifies the most important toxic pollutants by considering risk of harm to public health.

TABLE 2.3-3
ARKANSAS STREET STATION TOXIC AIR POLLUTANT MEASUREMENTS

Parameter (part per billion - ppb)	Mean Concentration Per Year				
	1999	2000	2001	2002	2003
Benzene	4.108	2.897	2.294	3.195	2.265
1,3-Butadiene	.669	.495	.452	.638	.33
Carbon tetrachloride	.062	.065	.053	.089	.094
Chloroform	.053	.052	.05	.032	.035
Formaldehyde	1.45	1.61	1.57	1.97	1.63
Acetalodehyde	.97	1.36	1.15	1.08	1.29
1,4-dichlorobenzene	-	.669	.785	.9	.9
Ethyl benzene	2.667	2.4	1.45	1.41	1.45
Methyl chloroform	.131	.115	.057	.083	.068
Methyl ethyl ketone	.67	.71	.66	.6	.47
Styrene	.65	.44	.424	.445	.431
Toluene	11.113	10.033	7.7	11.064	8.603
Trichloroethylene	.056	.056	.05	.034	.025
Methyl tertiary-butyl ether	6.52	5.22	2.83	4.78	1.23

SOURCE: USEPA, 2004

Diesel particulate matter consists of more than one compound, making monitoring more difficult than for single toxic air contaminants. However, based on a limited amount of data, CARB has estimated the statewide, ambient, "population-weighted," cancer risk due to essentially all toxic air contaminants, based on year 2000 emissions, at 758 in 1 million, of which 540 in 1 million, or about 70 percent, is estimated to be due to diesel particulate (CARB 2000). That is, the average individual in the State of California has a 0.8 in 1,000 chance – beyond the risk from other sources, including hereditary factors and exposure to other substances – of developing cancer due to toxic air contaminants in the ambient air. The average risk in the Bay Area is less than the statewide "population-weighted" average since the latter is influenced heavily by the large

numbers of people living in the Los Angeles metropolitan area. The average risk from ambient toxic air contaminants is approximately 30 percent less in the Bay Area than in the South Coast Air Basin (i.e., the Los Angeles metropolitan area) and approximately 17 percent less in the Bay Area than that calculated for the statewide "population-weighted" average (CARB 1998).

ALTERNATIVE 1

The existing air quality along Alternative 1 is similar to the proposed project and typical of an urban setting.

ALTERNATIVE 2

The existing air quality along Alternative 2 is similar to the proposed project and typical of an urban setting.

ALTERNATIVE 3

The existing air quality along Alternative 3 are similar to the proposed project and typical of an urban setting.

NO PROJECT ALTERNATIVE

The setting for the No Project Alternative is the same as current conditions since construction of the 2.5 mile cable project would not occur.

REGULATORY CONTEXT

Regulatory Agencies

U.S. Environmental Protection Agency (EPA) is responsible for implementing the myriad of programs established under the federal Clean Air Act (CAA) that include establishing and reviewing the NAAQS and judging the adequacy of State Implementation Plans (SIP), but has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented. California Air Resources Board (CARB), the State's air quality management agency, is responsible for establishing and reviewing the state ambient air quality standards, compiling the California SIP and securing approval of that plan from EPA, and identifying toxic air contaminants. CARB also oversees the activities of air quality management districts, which are organized at the county or regional level. As a general matter, EPA and CARB regulate emissions from mobile sources (e.g., vehicles and trains) and the air districts (e.g., the Bay Area Air Quality Management District [BAAQMD]) regulate emissions from stationary sources associated with industrial and commercial activities.

Conformity Requirements

Under the federal CAA Amendments of 1990, federal agencies must make a determination of

conformity with the SIP before taking any action on a project. Conformity with the SIP is defined in the CAA Amendment as meaning conformity with a SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. The General Conformity Rule (40 CFR 93.150) applies to general projects in areas designated "non-attainment" or "maintenance" and covers direct and indirect emissions of criteria air pollutants or their precursors that are caused by a federal action, are reasonably foreseeable, and can practicably be controlled by the federal agency through its continuing program responsibility. The requirements of the General Conformity Rule, however, do not apply if the federal action would result in a *de minimis* increase in emissions. Title 23 U.S.C. of the Federal Transit Act (for which the Transportation Conformity Rule applies). Within the Bay Area Air Basin, these *de minimis* thresholds are 100 tons per year of O_3 precursors (ROG and NOx) and CO, equivalent to 548 pounds per day.

IMPACTS DISCUSSION OF AIR QUALITY

METHODOLOGY AND SIGNIFICANCE CRITERIA

The methodology of analyses to determine the potential intensity of impacts to air quality included a review of ambient monitoring data derived from the project area. To support the analysis, air emission from construction activities were derived from the Preliminary Environmental Assessment (Essex Environmental, 2003). Standards of significance were derived from Appendix G of the revised California Environmental Quality Act (CEQA) Guidelines. Impacts to air quality will be considered significant if the project:

- conflicts with an applicable air quality plan,
- violates any AAQS,
- contributes substantially to an existing or project-related air quality violation,
- exposes sensitive receptors to a substantial pollutant concentration, or
- creates objectionable odors affecting a substantial number of people.

Sensitive air quality receptors are defined as facilities or land uses that include people who are particularly susceptible to the effects of air pollution, including children, the elderly, and people with illnesses. Schools, hospitals, and residential areas are all examples of sensitive receptors.

PROPOSED PROJECT

Construction

The primary air pollutant from cable and switchyard construction activities is PM_{10} emissions from construction equipment and ground disturbance. In addition to PM_{10}, there are pollutants associated with construction equipment usage and vehicular emissions from transporting workers, equipment, and supplies. The worst-case scenarios for total project emissions during the construction phase are shown in **Table 2.3-4**.

TABLE 2.3-4
PROJECT CONSTRUCTION EMISSION ESTIMATES

Emissions (tons per day)				
ROG	CO	NO_2 (as NO_x)	SO_2	PM_{10}
0.014	0.248	0.161	0.020	0.037
0.014	0.248	0.161	0.020	0.038
0.014	0.248	0.161	0.020	0.038

ROG Reactive organic gas
CO Carbon monoxide
NO_2 Nitrogen dioxide
SO_2 Sulfur dioxide
PM_{10} Particulate matter less than 10 microns

SOURCE: Essex Environmental 2003

Although the air quality impacts from construction would be less than significant, implementation of the BAAQMD Mitigation Measures would further reduce temporary air emissions from project construction.

Mitigation Measure AIR-1: The following measures prescribed by BAAQMD to ensure that construction impacts are less than significant would be implemented:

- **Construction areas, unpaved access roads, and staging areas shall be watered at least twice daily during dry weather, or soil stabilizers shall be applied during active work.**
- **Trucks hauling soil and other loose material shall either be covered, have at least two feet of freeboard, or be sprayed with water prior to arriving and departing from the construction site.**
- **Construction vehicles shall use paved roads to access the construction site wherever possible.**
- **Vehicle speeds shall be limited to 15 mph on unpaved roads and construction areas, or as required to control dust.**
- **Paved access roads, parking areas, and staging areas at construction sites and streets shall be cleaned daily with water sweepers if excessive soil material is carried onto adjacent public streets.**
- **A carpooling strategy shall be implemented for construction workers prior to commencing construction (during construction worker orientation and training).**

- **Vehicles used in construction activities shall be tuned per the manufacturer's recommended maintenance schedule.**
- **Vehicle idling time shall be minimized whenever possible.**
- **The CPUC mitigation monitor shall monitor compliance with these measures during construction.**

Operation

Operation of the project would not result in any air emissions. Vehicular emissions associated with maintenance and repair of the project components would be the only sources of emissions during the operational phase. As shown in **Table 2.3-5**, using an estimated total of 1,000 vehicle miles per month (both light-duty and heavy-duty trucks) for maintenance and repairs, the total emissions during the operational phase would be considerably less than the BAAQMD thresholds of significant contribution of 80 pounds per day maximum for Reactive Organic Gas (ROG)[1], NO_x, and PM_{10} (BAAQMD, 1999a).

TABLE 2.3-5
OPERATIONS EMISSIONS ESTIMATES

Equipment	Emissions (pounds per day)				
	ROG	**CO**	**NO_2**	**SO_2**	**PM_{10}**
Equipment					
Light-duty truck (800 miles per month)	0.08	1.64	0.42	0.00	0.00
Heavy-duty truck (200 miles per month)	0.04	0.62	0.08	0.28	0.16
Switching Station and Powerline					
Operation totals (pounds per day)	0.12	2.26	0.50	0.28	0.16
Operations totals (tons per day)	0.00006	0.00114	0.00026	0.00014	0.00008

SOURCE: EPA, 1985a and 1985b

ROG Reactive organic gas
CO Carbon monoxide
NO_2 Nitrogen dioxide
SO_2 Sulfur dioxide
PM_{10} Particulate matter less than 10 microns

SOURCE: Essex Environmental 2003

[1] ROG is not a criteria pollutant, but is an important precursor to the formation of ozone. ROG combines with sunlight and oxygen to create ozone, which is a problem in the BAAQMD and in most areas of California.

ALTERNATIVE 1

Implementation of Alternative 1 would result in impacts similar to the impacts resulting from the implementation of the proposed project, but the overall air contaminant contribution from construction would be less because of the shorter route. This route would have no impact on apartments and condominiums that would be affected by air emissions from the proposed project on Cesar Chavez Street, Minnesota Street, and 25th Street.

ALTERNATIVE 2

Implementation of Alternative 2 would result in impacts similar to the impacts resulting from the implementation of the proposed project.

ALTERNATIVE 3

Implementation of Alternative 3 would result in impacts similar to the impacts resulting from the implementation of the proposed project.

NO PROJECT ALTERNATIVE

The No Project Alternative would avoid all short-term and/or long-term air quality impacts associated with the proposed project. In fact, impacts associated with air quality would be less than the proposed project.

CHECKLIST IMPACT CONCLUSIONS

a) The proposed action would not conflict with or obstruct the implementation of air quality plans in the BAAQMD, since all air pollution emission sources would be operated within permitted limits.

b) The proposed action does not violate any air quality standard or contribute to an existing or projected air quality violation.

c) During construction of the cable, there would be a temporary increase in the following criteria pollutant emissions:

- PM_{10} from fugitive dust emissions during clearing, boring, and trenching operations
- Exhaust emissions from construction equipment, including the criteria pollutants carbon monoxide, sulfur dioxide, nitrogen oxides and PM_{10}.

The potential impacts of the construction emissions presented were compared to the BAAQMD CEQA Guidelines "Thresholds of Significance" (BAAQMD 1999a). Because the BAAQMD CEQA Guidelines stipulate that "if all the control measures indicated in Table 2 of the Guidelines, as appropriate (depending on the size of the project area), will be implemented, then air pollutant emissions from construction activities would be deemed a

less than significant impact," the construction emissions from this project would be less than significant.

Operation of the project would not result in a significant cumulatively considerable increase of any criteria pollutant emission for which the region is in nonattainment.

d) Fugitive dust emissions from construction activities would cause increases in ambient air particulate matter concentrations at receptors near the cable corridor. Construction dust is composed primarily of large particles that settle out of the atmosphere with increasing distance from the source. In general, construction dust would result in more of a nuisance than a health hazard. About one-third of the dust generated by construction activities consists of PM_{10} in the range that can be inhaled by humans, although these particles are generally inert. Persons with respiratory diseases who may be immediately downwind of the construction activities could be sensitive to this dust. Therefore, the short-term PM_{10} air quality impacts from fugitive dust during construction would be significant unless mitigation measures prescribed by BAAQMD are implemented.

Although exhaust emissions from construction vehicles are much lower than fugitive dust emissions, some of them (NOx and VOCs) contribute to the formation of ozone, a nonattainment pollutant, and fine particulate matter from exhaust emissions would contribute to ambient air PM_{10} levels. Thus, short-term ozone impacts would be significant, and PM_{10} and $PM_{2.5}$ impacts would be significant at locations near the construction site unless mitigation measures are adopted to reduce exhaust emissions.

e) The project would not create odors affecting a substantial number of people. There are no odor complaints with regard to the existing facility, and operations in the future are not expected to result in increases of odorous pollutant emissions.

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